

REMARKS

This paper responds to the Office Action mailed on January 22, 2007.

Claims 5, 6, 11 and 12 are amended, no claims are canceled, and no claims are added; as a result, claims 1, 5-7, 9-12, 14-15, 17-22 and 30-35 are now pending in this application.

Information Disclosure Statement

Applicant submitted a Supplemental Information Disclosure Statement and a 1449 Form on September 25, 2006. Applicant respectfully requests that an initialed copy of the 1449 Form be returned to Applicant's Representatives to indicate that the cited references have been considered by the Examiner.

§102 Rejection of the Claims

Claims 1, 9, 10 and 17 were rejected under 35 U.S.C. § 102(a) for anticipation by Weimer et al. (U.S. Publication 2001/0014522). Applicant respectfully traverses this rejection.

Weimer discloses rapid thermal processing (RTP) of a gate stack in a reducing ambient, such as hydrogen, ammonia or hydrazine, to ensure low oxidation of tungsten or metal nitride (para 0028) in a gate electrode stack. Applicant respectfully submits that there is no disclosure of any form of fluorine containing gas, ambient or fluorine containing layer in the Weimer reference. The Examiner previously noted that the cited Weimer reference does not disclose the use of nitrogen fluoride (NF₃). The cited reference of Weimer teaches that the use of tungsten silicide results in less oxidation than the use of tungsten or tungsten nitride (see figure 6 and associated text beginning in para. 0030). There is no description, discussion or suggestion of reducing redeposition onto the substrate of a volatilized portion of the metal film. Weimer discloses reducing the amount of tungsten that is oxidized, but does not address volatilized metal, which may occur in any high temperature operation, not just oxidations. Weimer does not even suggest that there may be an issue related to redeposition of volatilized metal.

Specifically, Applicant respectfully submits that the cited reference does not disclose at least the feature of providing fluorine to “...*reduce redeposition of the metal film on the substrate and on the gate stack of a volatilized portion of the metal film* ...”, as recited in claim 1. There is no recognition in the cited reference of the issue of volatilized metal, or of metal

redeposition. Nor would the reference suggest, whether taken alone or in any combination with other well known art, the claimed method, since Weimer is directed towards reducing oxidation and not towards a reduction in redeposition of a volatilized metal.

Applicant respectfully submits that the reference does not disclose at least the feature of “...*thermally processing the structure in the presence of a first composition such that the metal is more likely to combine with at least a portion of the first composition than with the structure*...”, as recited in claim 9, from which claims 10 and 17 depend. The cited reference may disclose how to reduce oxidation, but does not disclose or suggest anything regarding reducing the redeposition of volatilized metal, and certainly nothing about providing a material having a higher reactivity to the volatilized metal than does the substrate to reduce the redeposition.

The dependent claims are held to be in patentable condition at least as depending from base claims show to be patentable over the suggested combination of reference in the above discussion. In view of the above, Applicant respectfully requests that this rejection be reconsidered and withdrawn.

Claims 9, 14 and 15 were rejected under 35 U.S.C. § 102(e) for anticipation by Wege et al. (U.S. Publication 2002/0011461). Applicant respectfully traverses this rejection.

The newly cited reference of Wege discloses etching a metal layer in a plasma assisted gas atmosphere at a temperature of over 130 deg C. The plasma contains a halogen compound and an oxidizing agent. Plasma excitation causes the halogen compound, such as Freon, to break down to form halogen radicals (see para 0042), which then attack the metal containing layer 4 (see figure 1). Over the metal layer 4, there is a masking layer 6 or 8 which may be formed of polysilicon or a photoresist (see para 0038) which is an organic material as may be seen in para 0043 that the presence of an oxidizer in the plasma ambient reacts with the carbon to form carbon dioxide. In either case, the presence of an oxidizing portion of the plasma ambient “means that a fresh passivation layer 8 is continuously formed, counteracting the abrasion” of the etching mask due to attack from the halogen radicals (see para 0044).

Applicant respectfully submits that the cited references of Wege does not disclose at least the features of “...*thermally processing the structure in the presence of a first composition such that the metal is more likely to combine with at least a portion of the first composition than with*”

the structure ...”, as recited in claim 9, from which claims 14 and 15 depend. The cited reference discloses etching the metal layer and does not suggest anything with regard to preventing redeposition of the metal on the structure. For example, the dependent claims recite that the composition may include nitrogen trifluoride in a solid form or in a gaseous form, which is not disclosed or suggested in the cited reference.

In view of the above noted failure of the cited reference to disclose or suggest at least the above claimed features, Applicant respectfully requests that this rejection be reconsidered and withdrawn.

Allowable Subject Matter

Claims 5, 6, 11 and 12 were objected to as being dependent upon a rejected base claim, but were indicated to be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The claims have been rewritten to either be in independent form, or to depend from an allowable independent claim, and are believed to be in allowable condition.

Claims 7, 18-22 and 30-35 were allowed. Applicant thanks the Examiner for the indication of additional allowable subject matter.

Reservation of Rights

In the interest of clarity and brevity, Applicant may not have addressed every assertion made in the Office Action. Applicant's silence regarding any such assertion does not constitute any admission or acquiescence. Applicant reserves all rights not exercised in connection with this response, such as the right to challenge or rebut any tacit or explicit characterization of any reference or of any of the present claims, the right to challenge or rebut any asserted factual or legal basis of any of the rejections, the right to swear behind any cited reference such as provided under 37 C.F.R. § 1.131 or otherwise, or the right to assert co-ownership of any cited reference. Applicant does not admit that any of the cited references or any other references of record are relevant to the present claims, or that they constitute prior art. To the extent that any rejection or assertion is based upon the Examiner's personal knowledge, rather than any objective evidence of record as manifested by a cited prior art reference, Applicant timely objects to such reliance

on Official Notice, and reserves all rights to request that the Examiner provide a reference or affidavit in support of such assertion, as required by MPEP § 2144.03. Applicant reserves all rights to pursue any cancelled claims in a subsequent patent application claiming the benefit of priority of the present patent application, and to request rejoinder of any withdrawn claim, as required by MPEP § 821.04.

CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance, and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney David Suhl at (508) 865-8211, or the undersigned attorney at (612) 349-9587 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

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By their Representatives,

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Date

5 April '07

By

Timothy B. Clise
Reg. No. 40,957

CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Mail Stop Amendment, Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 5 day of April 2007.

Name

DATEGANNON

Signature

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